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# The Understandability of Models and Repercussions for Engineering and Acquisition

Giammarco, Kristin; Auguston, Mikhail; McGuire, Mollie

Monterey, California. Naval Postgraduate School

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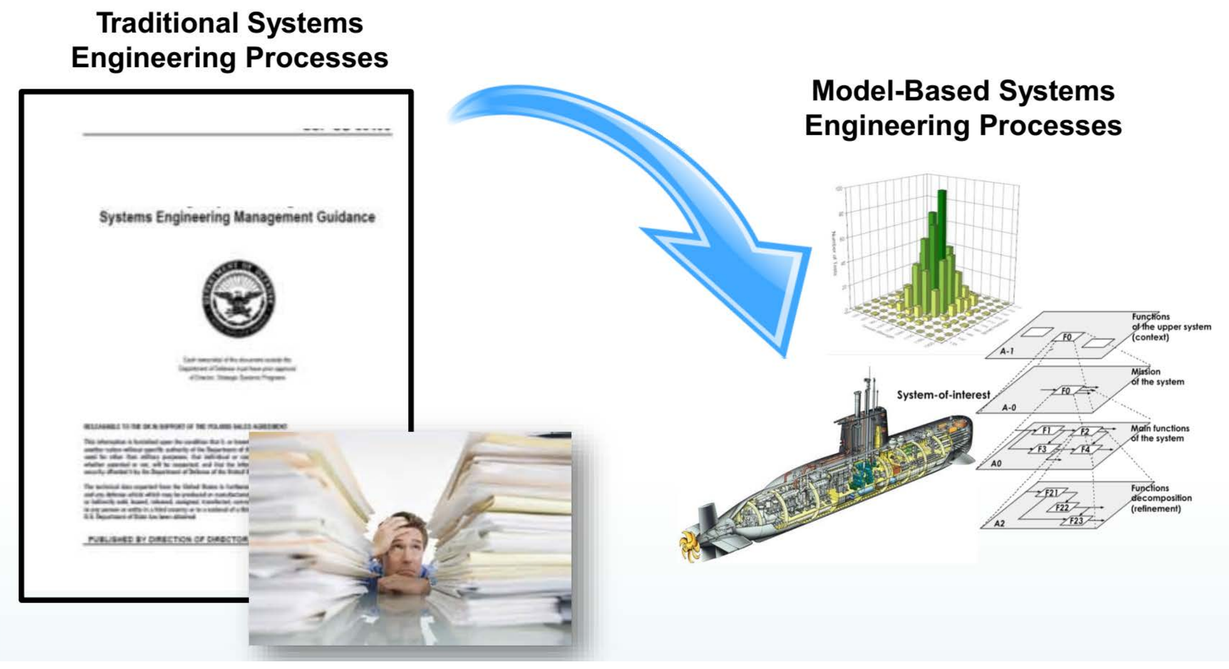
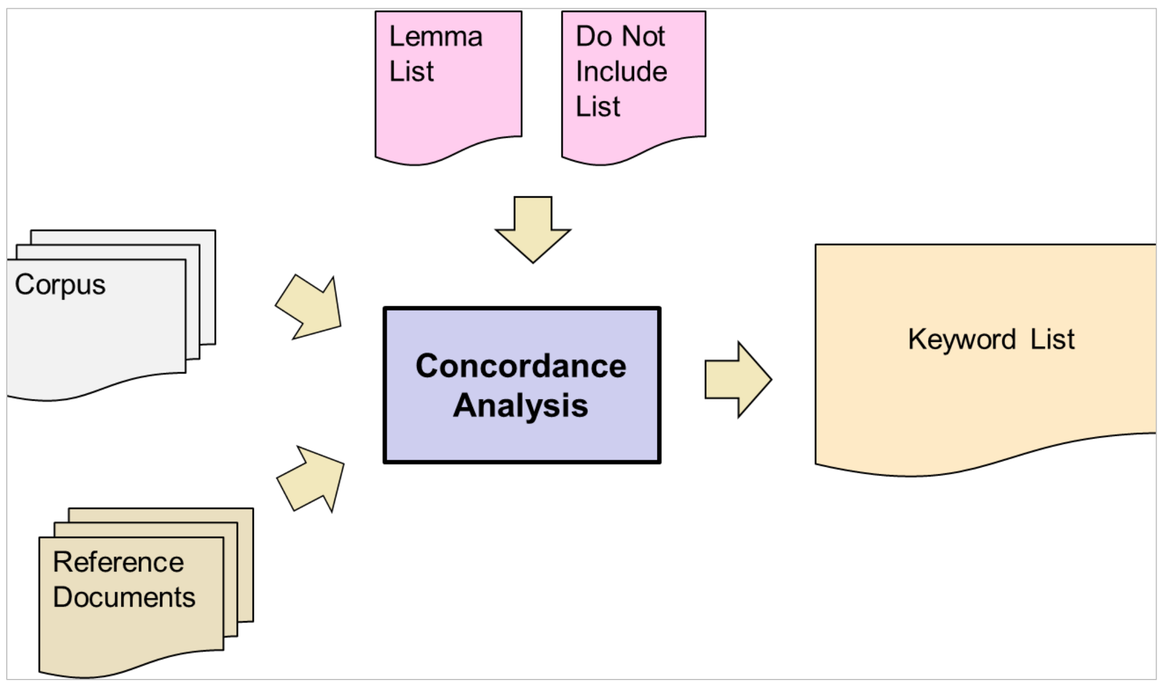
## Problem

- The Navy and the Department of Defense are establishing a model-based systems engineering (MBSE) to formalize the use of models and elevate them as a means for the representation, storage, and communication of system data.
- MBSE is in contrast to traditional paper documentation of system requirements and data.

*How do models affect human reasoning, if at all, about the system of interest?*




*Shift to MBSE*



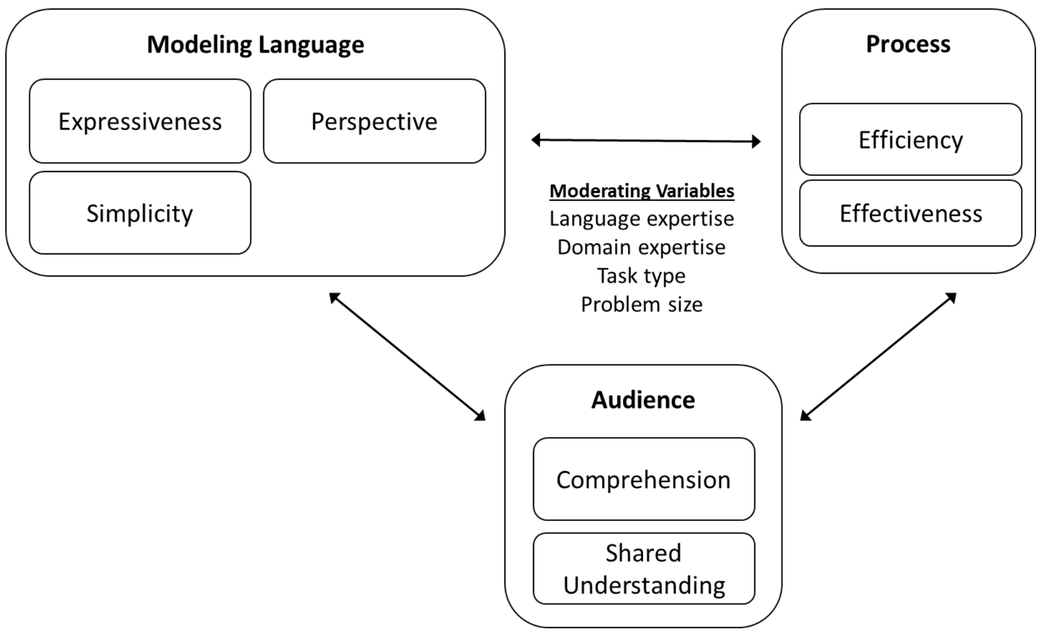

*Concordance Analysis of DM2*

## Evaluation of DoDAF

- The DoD mandates the use of the DoD Architecture Framework (DoDAF) to develop system architectures to support the JCIDS and acquisition process.
- In comparing DoDAF against the results of the text analysis of these systems engineering guidebooks we find three types of mismatches: differing names for the same concepts, differing aggregations or boundaries of a concept, and missing concepts.

## Testing of Engineers' Understandability of Models

- Does the model type affect a person's comprehension and hence ability to reason about the system-of-interest?
- A laboratory experiment with a control group and an experimental group working with documents and models respectively. Statistical tests to determine any differences between the performance of the two groups when performing engineering tasks.




*Experimental Research Model*

## Summary and Significance of Research

- Changing from a document intensive engineering and acquisition process to a model-based process possess potentially unexplored risks if the people in the programs cannot understand the models.
- This research seeks a better understanding of the human cognition process with respect to interpreting and using models.

**Dr. Ronald Giachetti** and **Dr. Karen Holness**
Department of Systems Engineering

**Dr. Mollie McGuire**, Department of Information Sciences